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OUR DOMESTIC POISONS;

OR, THE

Poisonous Effects of Certain Dyes & Colours USED IN DOMESTIC FABRICS.

BY HENRY CARR, M. INST. C.E.

WITH CONTRIBUTIONS BY NUMEROUS MEDICAL AND CHEMICAL
AUTHORITIES.

"Thus ornament is but the guilèd shore
To a most dangerous sea."—*MERCHANT OF VENICE, Act III, Sc. 2.*

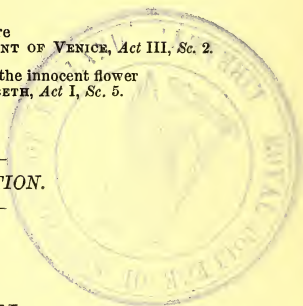
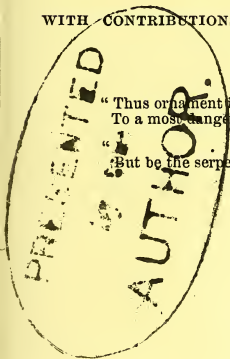
" . . . look like the innocent flower
But be the serpent under it."—*MACBETH, Act I, Sc. 5.*

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Poisons in relation to Medical Jurisprudence and Medicine. By ALFRED TAYLOR, M.D., F.R.S., late Professor of Chemistry and Medical Jurisprudence, Guy's Hospital. 3rd Edition, p. 344.

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Ditto. By FERRIER and GUY.

Fifth Report of the Medical Officer of the Privy Council, 1862. Pages 10--126.

Health and Industry. By BENJAMIN W. RICHARDSON, M.D., F.R.S. Daldy, Isbister and Co.

The Atmospheric Poisoning of Houses by Arsenical Wall-Papers. Reprinted from the *British Medical Journal*. London: Simpkin and Marshall. Bristol: Mack.

The Green of the Period. London: Routledge.

Poisonous Wall Coverings and their Effects. *Public Health Journal*, August and September, 1873.

British Medical Journal. Article by GEORGE OWEN REES, M.D., F.R.S., Consulting Physician to Guy's Hospital. 29th January, 1876.

Arsenical Poisoning by Wall-Papers, &c. By GEORGE JOHNSON, M.D., F.R.S., Senior Physician, King's College Hospital. Paper read at a Meeting of the National Health Society, June 18th, 1874. Reprinted from the *Sanitary Record* of July 4th and 11th.

Arsenical Wall-Paints. By FREDERICK JOHN BARRETT, F.C.S. *Pharmaceutical Journal*, 15th February, 1873.

Evil Effects of the Use of Arsenic in certain Green Colours. By FRANK W. DRAPER, M.D. *Chemical News*, July 19th, 1872.

Sanitary Record, November 1, 1878. Article by BERNARD DYER, F.C.S., A.I.C.

THE writer desires to acknowledge with thanks the encouragement and assistance he has received from the various Medical Men and Professors of Chemistry whose names are mentioned in the following paper; more especially are his thanks due to Dr. ALFRED S. TAYLOR, F.R.S., late Professor of Chemistry and Medical Jurisprudence, Guy's Hospital, and to Mr. HOGG, Consulting Surgeon to the Royal Westminster Ophthalmic Hospital, for the valuable information they have furnished, and for their advice on the preparation of this paper.

Any communications on the subject of Chronic Poisoning by Domestic Fabrics will be gladly received.

21, CEDARS ROAD, CLAPHAM, S.W.

December, 1878.

OUR DOMESTIC POISONS.

It is an unquestionable fact that national health is suffering from the use of arsenic and other poisons, in the manufacture of domestic fabrics, to an extent little appreciated by the public, notwithstanding that from time to time the injurious effects have been pointed out by numerous medical and chemical authorities.

From what has already appeared on the subject of chronic arsenical poisoning, it is evident that, although considerable attention has been given to the question by the medical profession, nevertheless public feeling has not been aroused to an extent sufficient to effect any diminution in the evils complained of.

In entering upon the consideration of the injury to health, arising from such use of arsenic and other poisons, it may be well, in the first instance, to remind the general reader what great results frequently arise from very slight causes : how the life of a family may be affected by an apparently trifling exhalation from a drain, or by the almost inappreciable contamination of milk : how the constitution has been influenced for life, in some mysterious manner, by milking a cow, an

accidental occurrence leading eventually to compulsory vaccination of the whole population. Men practised in matters of this kind do not, however, require to be told that a poison may be invisible, even under the highest power of the microscope; that there may be a deadly influence in the brightest water, or in the clearest atmosphere, though the sense of smell, taste, or sight may be incapable of detecting the mischief. In a similar manner, our rooms and clothing may be charged with poison without attracting observation till illness is produced.

That the question of arsenical poisoning is a most important one, affecting a large proportion of the population, cannot for a moment be doubted by those who are acquainted with the facts revealed in the publications above enumerated. One observation in the pamphlet on "Atmospheric Poisoning" is well worthy of attention—on p. 13, where the author refers to the effect of arsenic administered to a healthy subject for a length of time in very small quantities, as contrasted with the effect produced when given to a patient requiring it as a medicine; also to the effects of breathing an atmosphere in which arsenic has been diffused, as contrasted with arsenic taken by the mouth and acted upon by the stomach.

The consideration of arsenical poisoning at once raises the question of freedom of action. Perfect liberty consists in freedom for every man to do that which

is right in his own eyes; but it certainly is not a justifiable use of freedom for manufacturers to saturate our walls, furniture, or clothing, with subtle poisons which, by impregnating the air we breathe, frequently produce serious illness, and often have led to loss of life.

The manufacturer's action is supposed to be legalized or condoned by the fact of the ignorant purchaser being a free agent and a consenting party. But it may fairly be asked: Has a manufacturer a right thus to take advantage of a customer's ignorance? Does not the manufacturer know perfectly well that the public would not purchase a single piece of his wall-papers were they marked, "*Highly impregnated with arsenic, a subtle poison, throwing off poisonous particles which diffuse themselves for an indefinite period through the air of the room?*"

In selling arsenical fabrics without appending such notice, does he not, to say the least, take advantage of a purchaser's ignorance, and endanger the purchaser's life and health for the sake of a higher profit?

A matter of this kind should be looked upon from all points of view—from the manufacturer's as well as from that of the public.

If the law as it now stands does permit the sale of injurious articles, such articles being manufactured by means of arsenic or other poisonous substances of

a more pleasing colour and at a lower cost, does not the well-informed and conscientious manufacturer require protection against such unprincipled competition, and is he not entitled to it?

The cases of poisoning by a variety of fabrics in domestic use, when fully investigated, will be found so clear, and the mischief arising so great, that Parliamentary action and legal restraint are evidently demanded for the protection of the public, under circumstances where the vast majority, especially the poor, have no means of protecting themselves.

It is a fortunate circumstance that arsenic—the poisonous material most generally employed—can be easily detected by an examination to be obtained at a trifling cost.* It is, however, essential that a competent professional analyst be consulted—not an ordinary druggist. Such careful tests, indeed, are sometimes obtained by those whose attention has been called to the subject, but the number taking this trouble has been far too small to influence the trade. The poorer classes never do, and, clearly, they never could, take proper precautions. Even where

* Papers are examined for arsenic at very moderate cost by some competent analysts. The examinations required by the writer since taking up this subject have been made by Dr. Stenhouse, to whom his thanks are due for much valuable assistance and information. Where a test for arsenic is required, and no analytical chemist is personally known, the best course will be to refer to the "Public Analyst" of the district.

a certain amount of care is taken, there is no security without an examination of the actual paper delivered. For instance, a paper marked "non-arsenical" having been selected by the writer from a sample-book of one of the first manufacturers in London, the paper when delivered was found to be "*highly arsenical*." The manufacturer replaced the paper without charge.

In the case of wall-papers, the green, as a rule, contain more arsenic than others; but colour, whether in papers or other fabrics, is no guarantee of freedom from arsenic. If not in the colour itself, it may still be in the mordant for dyes or in other material used in the manufacture of the article. It is quite a mistake to suppose that if a green colour be avoided there is no danger from arsenic, for arsenic in various combinations more or less dangerous is used in a great variety of colours—even in white, some white papers being loaded as heavily as green.

In all probability arsenic, as a pigment, was first used in greens, and this may have given rise to the erroneous impression that it is green alone that is injurious; whereas colour is no guide whatever to the purchaser, the danger is simply in proportion to the quantity of arsenic and in proportion to the facility with which it may be removed from the fabric, either as dust or as gas. The public is, to a considerable extent, already alive to the danger of bright emerald green papers, but by no means so to the dangerous

quality of dull greens and other colours. It is, therefore, against these that a caution is more especially needful. The expression very commonly used, "*This is not an arsenical green,*" proves that the public are not aware of the true facts of the case, and are, through ignorance, liable to surround themselves with materials highly dangerous to health and life. Those who have not paid attention to the subject can have little idea of the amount of illness and suffering which are continually arising from this cause. There is high authority for stating that a very large amount of sickness and mortality amongst all classes is attributable to chronic arsenical poisoning, and that it may eventually prove to be the true cause of many of the mysterious diseases of the present day, which so continually baffle medical skill.

There are two processes by which arsenic is brought into contact with the system—the one by dust, the other by gas. As regards dust, we have valuable information from Dr. Alfred S. Taylor, late Professor of Chemistry and Medical Jurisprudence at Guy's Hospital, as follows :—

"The pigment of arsenicated wall-papers contains a large proportion of arsenic, and from some of these papers in the unglazed state the noxious material may be easily scraped or removed by slight friction : thus arsenic is liable to be distributed through the air of the room in a state of fine dust." He detected this

poisonous dust on books, picture-frames, furniture, and projecting cornices of rooms thus papered. The workmen who hang these papers or strip them off the walls are well known to suffer from symptoms referable only to the action of arsenic. One gentleman, as stated by Dr. Taylor, who had his library papered with an arsenicated wall-paper, suffered from symptoms of arsenical poisoning, which came on after he had been occupied in dusting his books, and on examination a well marked quantity of arsenic was found in the dust.

With regard to the gaseous combinations of arsenic, we have the authority of Dr. H. Fleck, of Dresden, who thus reports on his experiments: "Unmistakable cases of poisoning have arisen from inhabiting rooms hung with arsenical wall-papers, where, on account of the character of the paper, or for other reasons, it was impossible to ascribe the poisonous effects to portions of the colouring matter mechanically detached. For this reason, and because in certain cases the odour of garlic had been noticed in rooms thus papered, it was long suspected that there was actually generated, under some circumstances, arseniuretted hydrogen.

"Experiments were made on a paper coloured with Schweinfurt-green, an aceto-arsenite of copper. Starch paste was used to fix the colouring matter on the paper, and also to fasten the paper to the inside of a large tubulated bell glass.

“The bell-glass thus lined, and while the paste was still moist, was placed upon a well-ground glass plate; the bell-glass was hermetically closed, and the apparatus was left to itself for three weeks. A growth of mould appeared between the paper and the glass sides, and the air within the jar acquired a musty odour. At the expiration of the three weeks, a slow stream of air was passed through the jar, and the presence of arsenic was shown conclusively in the air, as it issued from the apparatus. The arsenical compound thus present in the air, gave, with a solution of salt of silver, the ordinary reaction of arseniuretted hydrogen. A similar experiment, in which was employed a flask, coated on the inside with a mixture of gelatine and Schweinfurt-green, gave a similar result. It was found that a mixture of arsenious acid and starch paste gave rise to the formation of arseniuretted hydrogen; but no arsenic could be detected in air which had been in contact with a mixture of arsenious acid and water without the presence of any organic material.”

From these and confirmatory experiments, Dr. Fleck concludes that there can no longer be any doubt of the possible presence of arseniuretted hydrogen in the air of a room hung with paper which is coloured with Schweinfurt-green; that the evolution of this gas takes place on account of the joint action of moisture and of organic matters (especially such substances as are used in fixing the paper to the walls); and that wherever

free arsenious acid is in contact with organic substances, the evolution of the gas is possible. The danger, then, is by no means confined to Schweinfurt-green, but may arise from any colour which contains arsenic.

Professors Roscoe and Schorlemmer express a confirmatory opinion, as follows, in their "Treatise on Chemistry," Vol. I, p. 518 :—

"Hydrogen is evolved during the growth of mould and certain fungi, and it is possible that if arsenic compounds are present where such growths are going on, arseniuretted hydrogen may be evolved. This may perhaps explain the evil effects noticed when arsenical wall-papers are employed. At the same time, it must be remembered that in those cases arsenic doubtless finds its way into the system in the form of dust, which in such rooms invariably contains it."

The question whether one is poisoned by dust or by gas is a matter of interest to the medical profession, but it is of little consequence to the public; the practical fact for their consideration being this—namely: that great numbers do suffer more or less, many most severely, from poisoning by arsenical fabrics, and that, when the mischief has not gone too far, they do recover on removal of the arsenical paper or other fabric—thus demonstrating the origin of the malady.

The following again, from Roscoe and Schorlemmer, p. 541, is much to the point in relation to this subject :—

“The employment of arsenical wall-papers is much to be deprecated ; still more is the employment of the insoluble arsenical green for colouring light cotton fabrics, such as gauze, muslin, or calico, to be condemned. The colour is merely pasted on with size, and rubs off with the slightest friction.” And the *Spectator*, of Sept. 22, 1877, in a review, remarks upon this particular point, as one “deserving attention, because it appears that arsenic is being largely employed in the manufacture of aniline colours, so that *it is not only in bright green papers*, but also in a number of others *that poison lurks*. We have heard of such serious yet insidious effects arising from the unsuspected presence of arsenic, that we venture to suggest the absolute prohibition of the use of this substance in the manufacture of clothes, furniture, or household decorations of any kind. It would surely be better to sacrifice a few of the beautiful new dyes and colouring materials rather than surround ourselves with poison ; and chemists, debarred from using arsenic, would soon find satisfactory substitutes.”

Commenting upon the above remarks from the *Spectator*, Dr. Alfred S. Taylor writes :—“The enclosed sample of paper was sent to me the other day. It looks very arsenical, but it contains no arsenic ; the colour is owing to Prussian-blue with a yellow dye. This paper shows how easy it is to produce a pleasant green on paper, without any risk of poisoning.”

There is an impression abroad that by distempering

walls, instead of papering them, all danger from arsenic may be avoided. This, however, cannot be relied upon; for there is frequently arsenic in distemper, which is always mixed with size to make it adhere: thus forming a direct combination of arsenic and organic matter, liable to give off arsenic under any circumstances, but in the case of damp walls, ready for the development of arseniuretted hydrogen.

Attention should be particularly drawn to the green arsenious lamp-shades, so universally employed and so frequently found to produce injurious effects. The headaches, irritation of the eyes, and other symptoms are generally attributed to the case of coal gas; but the mischief in most cases is no doubt due to the arsenic in the shades, rather than to the impurities of the gas. Indeed, the same complaints are made where oil is used, especially with the powerful new burners, which develop great heat as well as strong light.

A large class of poisonous dyes has no doubt been added by the recent introduction of aniline colours; affecting more particularly articles of dress. Arsenic is employed on a very large scale in their manufacture. It is also used in indigo dyes, where a mineral poison would be least suspected. Arsenic is, in fact, present in such a variety of dyes and colours as to render any judgment from colour on the part of the general public entirely out of the question. It should be here observed, that it is not arsenic merely that renders

aniline colours poisonous, some being found highly injurious, where, after careful analysis, there was clearly no arsenic present in the fabric.

The following communications from Dr. Bartlett and Mr. Bernard Dyer are important on the question of aniline dyes, the irritating effects of which are extremely injurious :—

*From H. C. BARTLETT, PH.D., F.C.S., 39, Duke Street,
Grosvenor Square.*

After alluding to a great number of cases of poisoning by arsenical wall-papers and by lead paint, Dr. Bartlett proceeds respecting aniline dyes:—"I should also class with these preventable dangers the aniline-dyed taffeta gloves and silk handkerchiefs, of which I have had a large number of specimens submitted to me for analysis. Severe irritation of the hands of delicate women and children has accompanied the wearing of gloves dyed with aniline salts, arsenic, and vanadium, and in some instances a considerable vesication of the skin has marked the urticating nature of these poisonous dyes. Even more distinct is the simulation of the so-called hay-fever, by the violent irritation of the mucous membrane of the nose occasioned by the application of silk handkerchiefs dyed with antimonial salts of aniline. All diffusive poisonous matters ought to be prohibited from use in

painting or papering the interior of domestic habitations; and I am sure that no article of clothing should be permitted to be sold when it can be proved to be dyed with materials which are liable to exert any poisonous influence.

“I should advise application to be made early next session to the President of the Local Government Board, to permit a deputation to wait upon him for the purpose of laying before him a proper statement of the facts. This deputation should include as many scientific and medical men of weight and position as can be brought together, and a firm demand should be made to secure legislation at the earliest opportunity. If I am able to assist you in bringing the matter before the public and the proper authorities, I shall have very great pleasure in so doing.”*

From BERNARD DYER, F.C.S., A.I.C., *Member of the Society of Public Analysts, Consulting Chemist to the Devon County Agricultural Association, the Notts Chamber of Agriculture, etc., 17, Great Tower Street, E.C.*

“Most unpleasant consequences not uncommonly arise from the improper use of the aniline colours. It

* The writer of this pamphlet will be glad to receive any further suggestions or observations with regard to the deputation suggested by Dr. Bartlett.

is well known that arsenic is largely used in the preparation of these dyes, but under proper management none of the arsenic passes into the "finished" dye. The painfully irritant effects which have been frequently observed from stockings, gloves, &c., dyed with aniline colours cannot, therefore, be attributed to any other source than the dyes themselves, the secret of the mischief probably being that the colours have not been thoroughly "fixed." Aniline itself taken internally is a strong narcotic poison, and its external action is that of a local irritant. It is not difficult, therefore, to understand that in its numerous chemical derivatives the aniline dyes may partake of its irritant properties. Aniline colours are now largely used in artificial-flower making, not merely for brilliant colours, but on sombre leaves, bunches of berries, and dyed grasses.

"An instance came under my own immediate observation some time since, in which a lady suffered for some time from a mysterious magenta colouration of the skin of her head. She wore no coloured ribbons or flowers that could ostensibly account for the symptoms, and it was only after considerable inquiry and much speculation that they were traced to a bunch of dark-coloured dyed grasses that she was in the habit of wearing in her cap during the day. Other ladies of the family, who wore somewhat similar flowers or grasses in their bonnets, were subject

to the appearance of mauve stains on the forehead, &c. It was subsequently found that brilliant mauve and magenta streaks could be readily produced by rubbing these black and bronze grasses on damp paper. A peculiar feature of the case was that the colouration could not be removed from the head by mere washing—the skin, in fact, becoming dyed. During the night, however, the colour seemed to come out from the skin in the perspiration sufficiently to dye a night-cap very distinctly in the course of one night. There moreover appeared to be considerable irritation from the fact that the lady usually observed in the morning that the tips of her fingers were dyed crimson, evidently owing to her having rubbed her head during the night. The colour on the fingertips was difficult to remove, but seemed to wear out during the day. The medical attendant of the family was much puzzled until the explanation was arrived at, and was almost driven to the conclusion that some peculiar exudation was proceeding from the skin; upon which inquiries were made as to the possibility of aniline having been in any way introduced into the food of the family.

“I have thought the details of this case sufficiently interesting to be of use to you in the laudable movement in which I understand you are engaged.”

It is thus an unquestionable fact, substantiated by the highest medical authorities, that our house decorations and our dress materials are, to a very great extent

saturated with most deleterious poisons. Arsenic is found in wall-papers and in the new Japanese paper hangings; in materials for dress, in curtains and curtain-linings; in ornamental feathers, artificial flowers, lamp-shades, fly-papers,* and in a variety of other materials—all more or less impregnating the atmosphere of our houses with poison. At the same time, the aniline dyes are producing serious effect by contact with the skin.

The cases of decided illness and of death arising from these causes, although far more frequent than is generally supposed, by no means comprise the whole of the mischief. Another evil is that of the insidious and unsuspected action of the finely divided particles of arsenic which, thrown off and diffused through the air, exert a lowering influence on the general health, more especially on mothers and young children; in both of whom a sadly disastrous undermining of the constitution goes on, ending ultimately in many cases in a break-down of health.

Symptoms of chronic arsenical poisoning so often simulate other complaints, that those who are not alive to the real cause of the mischief are liable to be misled.

Medical men attach more or less importance to these questions as they may happen to have had more or less experience in such cases, or, rather perhaps, as their attention may or may not have been called to the true nature and origin of the disease.

* "Fly papers," see Dr. Ord's letter, page 46.

Some remarks, by Mr. C. E. Groves, Secretary of the Institute of Chemistry of Great Britain and Ireland, as to the difficulty experienced in the diagnosis of chronic arsenical poisoning, coincide with the above observations :—

“The frequent occurrence of arsenical poisoning from paper-hangings is very generally overlooked by medical men ; many, even when it is pointed out, will not believe in it. This arises no doubt in most instances from the symptoms which are produced being so various, and having such a strong resemblance to symptoms arising from totally distinct causes.”

As to the injurious effects on those employed in factories, see the Report of the Medical Officer of the Privy Council, 1862, p. 10-13, and 126-132.

“In an establishment employing about one hundred young women in the manufacture of artificial leaves, Dr. Guy found more or less suffering was almost universal amongst the workpeople. The skin affection, which hardly any of them escaped, and which sometimes would begin even after so little as one day’s working, occurred in different degrees ; sometimes as mere erythema, sometimes as an eruption of clustered papules, vesicles, or pustules ; sometimes as more or less destruction of the skin by process of ulceration or sloughing. The fingers, which (often with accidental chops or scratches on them) are the immediate agents in the industry ; the face ; the neck, especially about

the roots of the hair; the flexure of the arms; the axilla; these were the parts where the skin disease had most shown itself,—parts, namely, to which the arsenical dust is most largely applied, and parts where it is most likely to be retained, and parts where the cuticle is most thin and penetrable. The suffering from these skin-affections had been in many cases very considerable; for instance, in several cases the affection had been such that the sufferer could not bear to sit down.

“But the skin affection was only a minor part of the suffering. Of twenty-five of the sufferers whom Dr. Guy examined, nearly all showed signs, often highly developed, of chronic arsenical poisoning; excessive thirst; nausea and loss of appetite; sickness and vomiting, often with pain in the stomach; palpitation and shortness of breath; debility, fever, headache, drowsiness, dimness of sight and tremblings, nervous twitchings or convulsions. Of the whole group of twenty-five females (says Dr. Guy), four only did not complain of weakness; and of the remaining twenty-one, there were again only four who did not describe the weakness as extreme. Febrile symptoms were present in no less than twenty cases, in five of which they amounted to feverishness, while in the remainder they were described as fever. Headache was an almost universal symptom. It was absent in two cases only, and was described as not severe in only three

cases. Dimness of sight was complained of in two-thirds of the cases. In one the eyes were very sore, in another the sight was greatly impaired. Drowsiness was present as a marked symptom in every instance but one, and in two cases only was it spoken of as a trivial circumstance. Tremblings and convulsive twitchings were present in seven cases out of the twenty-five, and in one other instance well marked convulsions were present."

One case of death is described, the symptoms of which are given in detail in the report, but need not be repeated here. The concluding sentence, however, is much to the point at the present moment. It is as follows :—

"The tortures which that poor girl must have endured will not have been in vain, if, as may be hoped, the public knowledge of them leads to the amendment of a system under which others are still, day by day, enduring in different proportions the progress of a similar fate."

Let each individual reader bear in mind that he is himself a responsible member of the public alluded to, and that this is no fanciful description, but a hard, dry statement, in a Blue Book, prepared under the direction of and published by our Government. Certainly not a very paternal Government, as far as these poor girls are concerned, for this report was made in 1862, and nothing has yet been done to remedy these frightful

evils, which, moreover, never will be remedied till public feeling is brought to bear.

Had the young women in such manufactories been slaves, the property of their employers, their lives would have been too valuable to be thus sacrificed ; but being free and employed on daily wages, the day's wage is paid for the day's work done, and as one falls off, another comes on.

The unhealthiness of an employment, it is well known, will not deter those who are seeking daily bread, the wages being somewhat in proportion to the risk run.

Such, then, is the fate which attends hundreds of young women and children, who, as artificial florists, suffer in the most terrible manner from handling and inhaling the poisonous arsenical green.

Ordinary Symptoms of Chronic Arsenical Poisoning.

It may be well to point out concisely what are the usual indications of arsenical poisoning which should lead to an immediate investigation. One universal feature may first be mentioned, namely, the inefficacy of all usual remedies—the presence of arsenic not being suspected.

The symptoms of chronic poisoning by arsenic begin with what appears to be an ordinary cold and cough ; dryness and irritation of the throat and frequent headache ; extreme restlessness ; great debility, accompanied by cold clammy sweats ; cramp of the legs ; convulsive

twitchings; and a group of nervous symptoms, varying in each case. Inflammation or irritation and smarting of eyes and nostrils is often the most marked symptom, lasting for days, weeks, or months, sometimes accompanied by irritation of the whole mucous tract, short dry cough, sore throat, running on to diphtheritic throat; ulceration and soreness of mouth and tongue; irritative fever, which if persistent, exhausts the patient, and death takes place by collapse, coma, or convulsions. Among the symptoms there has been occasionally irritation of the skin, accompanied with eruptions.

Numerous other special symptoms met with and known to medical men need not be enumerated, but the local application of arsenic in adulterated violet powder, and the fatal results which have so recently followed its use in Essex, must serve to show the dangerously virulent nature of the poison.

All persons suffering in the manner above indicated should at once have their wall-papers tested for arsenic.

One very remarkable cure of serious illness of two years' standing has been effected in consequence of attention having been drawn to the subject in making a fair copy of the rough manuscript of this pamphlet. All that was requisite was to take down the arsenical paper.

Reports of any cases of cure in consequence of reading this pamphlet would be of great interest to the writer.

ILLUSTRATIVE CASES.

WALL PAPERS.

REFERENCE to a few cases will best illustrate the importance of the preceding remarks. The three following instances are condensed from a paper read at a meeting of the National Health Society, June 18, 1874, by George Johnson, M.D., F.R.S., Senior Physician to King's College Hospital.

Dr. Hinds,* of Birmingham, papered his own study with green paper. Suffered from severe depression, nausea, pains in the abdomen, faintness, &c. Same occurred every evening when door closed and gas lighted for two hours: tested the paper, found it arsenical; paper removed: no return of the symptoms.

Another case in Birmingham: two rooms, papered with arsenical paper. Gentleman and his wife, who were in perfect health, in less than a week suffered from weakness, headache, fever, thirst, loss of appetite, inflammation of the surface of the eyes, heat and dryness of throat. A parrot hung in the same room became ill, refused its food. The gentleman went to Ramsgate, and recovered in a week; the lady remained at home and got no better. In two days after his return the

* The cases of Dr. Hinds and Dr. Halley occurred upwards of twenty years ago, and were much discussed at the time. They show how long the question of chronic arsenical poisoning has been before the public.

gentleman was again ill. The paper was removed, and both recovered in a week.

Dr. Halley, describing his own case, tells us his study was papered with an arsenical paper, one of the worst character—flock. Five or six hours after commencing work, the room being lighted with gas, he suffered from headache, dryness of throat and tongue, and internal irritation; previously in excellent health; after three weeks was completely prostrated, almost losing the use of the left side; recovered during absence from the study. The same symptoms on return to the room. The arsenical paper was removed and health regained.

A case is communicated to the writer by Dr. Stenhouse, F.R.S., late Analytical Chemist to the Mint. "About four years ago, Dr. W., a surgeon living in the neighbourhood of London, brought me a wall-paper loaded with Scheele's-green; his wife's health was at that time quite destroyed, and about six months afterwards she died, apparently from the effects of arsenical poison."

A letter from T. Lauder Brunton, M.D., F.R.S., Assistant Physician and Lecturer on Materia Medica at St. Bartholomew's Hospital, will carry weight as giving the result of his own personal experience. His remarks have also another important bearing respecting the effects of arsenic in wall-papers, as contrasted with arsenic given medicinally.

“I believe that colour is no guarantee of freedom from arsenic. The paper which caused so much injury to my own health was a dull green, such as one would hardly suspect to contain arsenic—arsenical greens being generally thought to be bright greens only. I have heard that many other colours contain arsenic, but have no personal experience on this subject. It is not a combination of arsenic and copper only which is injurious, but arsenic when present in wall-papers as a pigment of any kind will do mischief, the injurious action being due to a combination of arsenic with the paste by which they are fixed to the wall. An organic compound of arsenic is thus formed which is exceedingly poisonous, much more so apparently than arsenic itself. For a long time I did not believe in the injurious effects of arsenical wall-papers, because I knew that patients could take as a medicine, without any bad result, more arsenic than they were likely to get from the paper of their room; and it was only after I had learned, to my cost, how very powerful for evil arsenical wall-papers are, that I became acquainted with the explanation. The most marked symptoms in my own case were severe griping, followed by dysentery, although running from the nose and dry cough were not absent.”

Dr. Hodges, of Belfast, Professor of Chemistry to the Chemico-Agricultural Society of Ulster, has given great attention to this subject. On one

occasion he received the following letter from a gentleman, describing the sufferings of his own children:—

“I beg to give you the following particulars in reference to the effects produced by the green wall-papers which you so kindly analysed for me a few months ago. I bought them last November to paper the walls of the children’s day and night nurseries from a shop in Belfast, where I was told they were specially designed for nursery use. I got a paper-hanger in Randalstown to put them up, and he got sick before he had half finished the job, and left his son to finish it out. He has since told me that some green papers always affect him in this way. The paper had not been on ten days before two of the children (there were three in all) began to lose their vigour and animation. They had all been particularly healthy before. One little boy of three and a half years old was the first to show it. His throat became much ulcerated, and he got languid and weak. He was put to sleep in another room for about a fortnight, and his strength and vigour came back again; whereas our eldest little girl, who was still in the nursery, remained as she had been. We had no suspicion at the time that the paper had anything to do with it. On the little boy returning to sleep in the room with the green paper, he again fell back into the state he had been in before, and grew gradually worse and worse every week. We called in the local doctor, but he

was quite at a loss to understand the apparent epidemic. The children had by this time become all more or less affected in the same way, also the nurse and Mrs. — ; whereas all others in the house, who were not in the habit of being in the nurseries, were quite free. From fine healthy children they became weak and fretful; their necks became swelled and knotted, and their throats very much ulcerated. The little boy wasted away, and could hardly bear to be touched. He would often cower into a corner and cry out with apparent pain if he saw his youngest sister (the least affected) coming near him, to get him to play with her. A Dublin doctor, whom we afterwards consulted, said that their fear of being touched was one of the symptoms of arsenic poisoning. Ultimately it was suggested that the paper was the cause, and on getting your report, we at once had it taken off. In a very short time all became well, with the exception of the little boy and eldest girl. The health of the former was so completely undermined, that at one time it appeared as if he would not recover. I brought him up to Dublin as a last resource and placed him under medical care there, when he gradually got better, and in six weeks he was brought home again fairly restored to health, but not what he was before. The poison has apparently left him with a chronically ulcerated throat, from which, so far, he has never been free; although he never had any throat affection

till last November. The little girl is quite well, although for weeks afterwards the swelling came and went in her neck, causing considerable pain. I understand that precisely the same paper is to be found in many nurseries in Belfast and neighbourhood. Surely something should be done to call attention to the matter, or put a stop to the sale of such paper. The fact of the paper having been put up in the winter, when the children were a greater part of their time, both day and night, in either room, no doubt caused them to be affected more than they would be at another time of the year."

Having been informed that Dr. Leonard W. Sedgwick had himself suffered from chronic arsenical poisoning, application was made to him, and he kindly wrote as follows :—

"I suffered from sore throat and irritable eyes from a *blue* arsenical paper in my bedroom. One of the most singular cases of poisoning from arsenic in wall-paper was that of three children who had been unaccountably suffering for several weeks ; when I saw them I suspected arsenic, but was told that no new paper had been put up for several years. This seemed conclusive against it ; but in the course of conversation the lady spoke of a country girl she had taken as a nursery-maid, and of her industrious habits, mentioning in illustration that she was not satisfied with washing the floor, but that she brushed the walls. I

immediately requested that any dust that might be out of her reach, as on the top of a wardrobe, should be sent to me, and on examination found arsenic. I ordered the children to be taken from home, and no medicine given them. They got well in ten days. The paper was fairly safe, I doubt not, until the colouring matter was rubbed off by the diligence of the nursemaid."

The following is the case of Mr. John Penrice, of Clapham :—

November, 1878.

"I have suffered much in health during the last two years in a peculiar manner ; a paper, now found to be arsenical, having been hung in my bedroom some time previously. The symptoms began with restlessness at night, which increased very much and was frequently accompanied by terrible faintness and cold sweats, to such an extent that I have often had to get out of bed, sponge my face with cold water, and brush my hair very rapidly before I could regain any sort of composure ; and latterly, in addition, I have suffered from cramp of the legs and violent twitchings, so that I could not sleep for three or four nights consecutively. I have tried to sleep in a chair, on account of the dread I had of going to bed only to keep awake night after night ; alteration as to supper was without any beneficial effect, and I became generally very much weakened and depressed. My attention

having been drawn to arsenical papers, a sample of my bedroom paper was tested by Dr. Stenhouse, and found to contain much arsenic, sufficient to cause illness in anyone constantly using the room,—consequently the paper was removed ; the third night afterwards the cramp of the legs left me, by the seventh night I was no longer restless, the eighth night I slept fairly ; after this I continued to improve, and now I may say am rid of the horrible symptoms altogether, and have cause to feel very grateful for the suggestions which, I believe, have alone led to the relief of these sufferings.

“My wife thought it might be only nervousness on my part until she began to suffer from cramp in the hands herself, which gradually extended above the elbows, accompanied by sudden flushings and startings affecting the whole system. On the removal of the arsenical paper these symptoms ceased, and are now gone altogether.”

A lady's statement of her own case, communicated on the request of Dr. Alfred S. Taylor, F.R.S. :—

“Dr. Taylor has asked me to give you some further particulars about the effect on me from sleeping in a room papered with arsenical paper.

“I was subject to a troublesome eruption of the skin, continual boils, frequent ulcerated sore-throats, and any accidental graze or crack of the skin remained a sore for a long time.

“Numerous doctors were consulted and various remedies tried, but all without success. All said it was blood-poisoning, but the cause, viz., the paper, was not thought of at first. Absence from home invariably benefited me.

“On removing to London, where there were no hurtful papers, by slow degrees I became better and lost the eruption, but it took some years to accomplish the cure. In fact, it was not until seven years after leaving the house where the green paper was and after a still further *residence* at Dieppe of three years that I quite lost the tendency to eruptions of the skin.

“Dr. Taylor tried to convince my father that the green paper which he had examined and which he found highly arsenicated was the cause, but this idea being a new one to my father, he would not believe it had anything to do with my discomfort and my illnesses.

“I was subject year after year to severe attacks of bronchitis, which generally attacks those who are compelled to breathe this poisonous powder.

“If I were a doctor I should decidedly cast my eyes round the patient’s bedroom to see if its walls were papered with arsenical paper, especially supposing they were suffering from any skin disease.”

The importance of medical men being alive to the symptoms of chronic arsenical poisoning is shown in a case occurring in the family of a relative of the writer.

The statement of symptoms given on pages 20 and 21 of this pamphlet were accidentally brought under his notice. He at once sent his nursery wall-paper, one with pictures of green fields, trees, &c., for analysis, and in the following letter he gives the details of the case.

“Dr. Stenhouse reports this paper ‘very arsenical, one that ought not to be used, as it would in all probability seriously injure the health of any one constantly occupying the room where it is hung.’ What we have ourselves observed is that before the nursery was re-papered, the children were healthy and strong; immediately after, they became pale and sickly and suffered from loss of appetite, peeling of the skin, short dry cough, blinking of the eyes, and in one case ulceration of the leg. When taken from home they got well, but each time on returning the same symptoms recurred. We have grave reasons for thinking that our little boy, lately deceased, was seriously affected by the paper, as nearly every symptom you mention was noticed by us at one time or another previous to his last illness.”

In a letter of later date a further report is given :—
 “The children are now quite well, and have got back their colour. A curious circumstance that we have noticed is that a year ago we got a bullfinch which for a week or two sang and then ceased. Since we have had the paper changed in the dining room it has again

sung. While away for a month in the summer we sent the bird to a neighbour's, and they say that after a few days it sang there. Three cats also that appeared to have chronic coughs, since the papers have been changed, have never been heard to cough. My wife has been much better also, and we are much indebted to you for bringing this subject to our notice."

Here, then, we have marked symptoms of chronic arsenical poisoning going on for a great length of time, the cause unsuspected till the father became accidentally acquainted with the facts stated in this pamphlet. The injurious paper was removed, and the children are now perfectly well and free from the peculiar symptoms of arsenical poisoning.

The effect of an arsenical paper on a parrot has been mentioned—see p. 22. Mr. Penrice, whose case is given on p. 28, also mentions that his cat appeared to suffer from chronic bronchitis, but has not coughed since the arsenical paper has been removed.

*From DR. GUY, F.R.C.P., F.R.S., Consulting Physician
to King's College Hospital.*

"Soon after the inquiry which I conducted for the Privy Council, I attended two cases of arsenical poisoning by green wall papers, and quite lately I have been consulted respecting a third case.

"The first case was that of a singularly well made healthy and sensible woman, whose arms and legs were

paralysed, and who was so susceptible to the action of the poison, that she was conscious of it when she remained any time in a house with a green paper.

“The second case was that of a market-gardener, living a healthy life, whose arms were paralyzed, and his hands dropped at the wrist as in poisoning by lead.

“The third is the case of a lady, the head of a large establishment in the country, who complained of a most painful itching and tingling of the skin as the leading symptom. She occupied a spacious bedroom recently papered with a green paper found to be arsenical. A second paper was put up in its place, falsely warranted to be free from arsenic, yet the symptoms continued and even increased; but disappeared, and have not returned, on the removal of the poisonous paper and the substitution for it of a green paper free from arsenic.

“The cases of poisoning of the class in which you are interested are very numerous and very painful.”

From THOMAS PRIDGIN TEALE, M.A., F.R.C.S.

“Allow me to thank you for your courtesy in sending me a copy of your pamphlet on ‘Our Domestic Poisons,’ and to reciprocate it by sending you a copy of my lecture on ‘Dangers to Health,’ which I hope to post to-morrow. You certainly give overwhelming evidence of the prevalence of the evils of arsenic, and I

trust that your labour will be rewarded by legislative prohibition of the use of arsenic in wall papers, and punishment of those who employ it. In my larger work on 'Dangers to Health,' I have given a picture of 'stripping arsenical wall papers,' to enforce the lesson of the dangers such papers entail upon us. Your teaching that colour is no test of the absence of arsenic is most valuable.

"As to green shades to lamps, I have known a troublesome irritation of the eyes to result—in fact, this peculiar irritation of the eyes has led me several times to arsenical wall papers as a cause."

SUSCEPTIBILITY VARIES.—Some persons are not readily susceptible of arsenical atmospheric poisoning; others again are highly susceptible, and serious illness quickly ensues, there being every possible grade between. It should be observed that those in robust health are liable to be affected as much as the delicate. Irritation about the eyes, nose, and throat, and a general feeling of depression seem to be the first and most usual forms of slight affection.

A case of this description has come under the notice of the writer—that of a lady, in good general health, residing for some years at a friend's house in Derbyshire, always occupying the same bedroom. While there, she continually suffered from slight irritation of the eyes—on two occasions this amounted to severe suffering; during a year's absence she was free from

all such symptoms, but they recurred on her return to this same room. The paper was tested by Dr. Stenhouse, and found to be arsenical; since its removal, the unfavourable symptoms have entirely disappeared. There can be no doubt that the irritation of the eyes was the first effect on one not very susceptible, local trouble being produced, but no serious constitutional derangement.

The majority of mankind, it is true, may be exposed in various ways to the action of such poisons as lead, arsenic, &c., without experiencing ill effects. That fact, however, by no means invalidates the position here taken—viz., that great numbers are proved to suffer unnecessarily, and without any compensating public advantage.

TEXTILE FABRICS.

The foregoing are typical examples of injury from wall-papers; the instances which follow relate to textile fabrics of different kinds, articles of dress more especially.

Various instances of poisoning are given in a paper read by Dr. Hardwicke, Coroner for Middlesex, at the Social Science Congress, 1875.

That of a young woman, a cutter-out of dyed goods; of others poisoned by gloves, shirts, socks, shoe-lining, &c. The evil effects of the socks are especially well-known to the public.

In the German *Medical Times* (*Allgemeine Medicinische Central Zeitung*), a short report appears of a case in which the symptoms of poisoning were traced to the use of gloves charged with arsenic. "A gentleman, Major Von B——, travelling from Schleswig to Berlin, bought in Hamburg a pair of marine-blue gloves, and wore them; soon afterwards he became ill, and sought medical advice. His hands were covered with a peculiar eruption, which his physician could not account for, or understand, and he had a sensation of general weakness. On submitting the gloves to a chemical analysis, it was found that they contained a considerable quantity of arsenic, and this had been absorbed by the warm moist hand."

A young lady, lately suffering in her feet, came under the care of Dr. Myrtle, of Harrogate. Her case is reported as follows:—

She had for some time been wearing stockings of a deep red colour, and suffered from large inflamed blisters. She was under medical treatment for several weeks, but the blisters remained, notwithstanding that the stockings were discarded. Dr. Myrtle then discovered that she was wearing slippers lined with magenta flannel, which kept up the irritation. When this lining also was removed, she soon recovered.

Dr. Myrtle remarks that "he has had several cases where mauve-dyed articles of clothing have produced great local irritation, which, in one or two cases, has

proved not only painful, but most difficult of cure. Neckties and socks have furnished obstinate forms of an eruption of an herpetic character, the base of each vesicle being painful and greatly inflamed. The eruption has, in appearance and nature, resembled shingles more than anything else, although it is, as far as my observation goes, a distinct form of cutaneous disease."

The following is from the *Times*, of 20th August last, with reference to gloves of a very dark bronze-green colour, nearly black. The case was under Dr. Robert Blair, of Goole:—

"A short time since, my youngest sister, aged seventeen, bought a pair of new fashionable 'bronze green' silk gloves. After wearing them a day or two she was attacked with a peculiar blistering and swelling of both hands, which increased to such an extent that for three weeks she was compelled to carry her hands in a sling, suffering acute pain, and being unable to feed or dress herself. At the present time her hands are still swollen to double their natural size.

"My brother-in-law, a medical man of large experience, says, the symptoms are such as would be caused by the presence of arsenic in the gloves acting upon a delicate skin. Inquiries among our friends have discovered three other ladies suffering in different degrees from the same cause."

It should be noted, that the lady who suffered is stated to have a somewhat damp hand, which would

increase the susceptibility to any irritant. Dr. Alfred Taylor's remarks on this case are as follows :—

“The most delicate test for arsenic does not show the slightest trace in these gloves, but other tests show the probable presence of some of the aniline or coal-tar dyes, and indicate the presence of a soluble chromic compound, probably bichromate of potash or some other base. It is clear from these facts, and especially from the action of water, that some of the dyes used to give the bronze colour have been most improperly left in the gloves.

“No glove or other article of dress that is worn next the skin should contain anything soluble in water. Such substances would be liable to be taken up by exposure to the insensible perspiration, and thus irritate the skin, producing herpes or eczema, or it might enter the blood by absorption and cause symptoms of constitutional poisoning.”

The following, by Dr. George Owen Rees, Consulting Physician to Guy's Hospital, appeared in the *Times* :—

“I have had occasion more than once to bring cases before the notice of the medical profession, in which severe symptoms were experienced by patients who were being slowly poisoned with arsenic. This slow poisoning is going on at present very extensively. I have described a sad instance of poisoning by an arsenical colouring matter contained in the green calico lining of some bed-curtains. For months and months

this source of poison was not discovered, and the symptoms were treated as those of natural disease. On the removal of the curtains the patients at once recovered their health. This poisonous lining has been sold, and I believe is, still selling freely, and is doubtless producing severe suffering. There is, however, another source of arsenical poisoning of which I have only lately been informed, and against which I would especially warn your readers. It exists in the colouring matter of a green muslin, which, I am told, is much used for ladies' dresses. I am indebted to Dr. Debus, the Professor of Chemistry in our school at Guy's Hospital, for this observation. He made the examination of the bed-curtain lining above alluded to, and thinking that other green-coloured goods might also contain arsenic, he purchased some muslin of a very beautiful pale green tint for analysis. It proved to contain upwards of sixty grains of an arsenical compound (Scheele's-green) in every square yard, and this was so slightly incorporated that it could be dusted out with great facility. It is not easy to conceive anything more lamentable than this, nor do I see how the evil can be arrested save by the interference of Government.

“Here is a cause for nausea, vomiting, violent headache, inflammation of the eyes, &c., which can only be removed by stopping the manufacture of these deleterious fabrics. Our suspicion should not only be directed

to material of green colour, for Dr. Debus informs me that the beautiful red, scarlet, and mauve colours so much in use and so justly admired are sometimes contaminated with the arsenic used in their preparation the metal not being always properly separated. Imagine what the atmosphere of a ball-room must be where these muslin fabrics are worn, and where the agitation of the skirts consequent on dancing must be constantly discharging arsenical poison. The pallor and languor so commonly observed in those who pass through the labours of a London season, are not to be altogether attributed to ill-ventilated crowded rooms and bad champagne, but are probably in great part owing to the inhalation of arsenical dust, shaken from the clothing of a number of poisoners, who, though blameless, are not the less pestilential."

The following is the substance of an article in the *Lancet* of Aug. 11, 1877:—

"ON THE PRESENCE OF ARSENICUM IN SOME SAMPLES OF FURNISHING MATERIALS. By WM. FOSTER, B.A. (Cantab), F.C.S., Professor of Chemistry, Middlesex Hospital Med. Coll." :—

Mr. Foster's statement is that samples of furnishing materials were submitted to him for examination by the friend of a family who suffered from constant nausea and nervous depression. The material consisted of samples of chintz curtains and their linings,

together with the Brussels carpeting of the bedroom and ordinary day room. The curtains and linings were of various tints of green, the carpet of the ordinary mixture of shades of red and green. . . . The carpet was found to be innocuous, but the curtains and linings contained a poisonous quantity of arsenic. In each square yard of chintz, Mr. Foster found arsenicum equal in amount to $45\frac{1}{2}$ grains of *white arsenic*, and in the same quantity of lining $120\frac{2}{16}$ grains. No copper was present, but a quantity of chromium and *iron*, and it must be assumed that the colour employed was a mixture of *chromic and ferric arseniates*—a colouring matter not to be confounded with *Scheele's-green* or *arsenite of copper*.

Measuring the quantity of chintz and lining in the bedroom, it was quite certain that at least 26 oz. of arsenic must be adhering to the surface of the texture. Mr. Foster calls it "*Devil's Dust*;" and when upon calling upon the tradesman, the seller of the material, and finding that for twenty years he has been retailing quantities of the same material in ignorance, as he said, of its poisonous nature, it well deserves the name of "*Devil's Dust material*." This enormous quantity of arsenicum in the colouring matter of the curtains of an ordinary bed-room might well excite some surprise, and was calculated seriously to affect the health and happiness of those occupying a room furnished with such materials.

The circumstances attending the death of a number of children at Stoke Newington, from the use of violet powder containing arsenic, are important, as showing the poisonous effect of arsenic by absorption through the skin.

Since the first issue of this pamphlet the following letter has been received from Dr. Hofmann, the eminent Professor of Chemistry in Berlin, well known in this country, and long a resident in London:—

10, DOROTHEN STRASSE.

February 7th, 1879.

DEAR SIR,

I hasten to thank you for the transmission of your very interesting pamphlet. The subject is undergoing searching examination just now by the new German Board of Health (Kaiserliches Gesundheit Amst). I have immediately written to the Medical Officer of the Department, Professor Sell (19, Louisenstrasse, Berlin), requesting him to forward to you the draft of the new law regarding colours, which will probably be submitted to the next Parliament. There have been regulations on the subject in Germany, but they have hitherto produced but little effect, partly, I have no doubt, owing to their local character. Now that the Imperial Board has taken up the question, the results will, I hope, be more satisfactory.

It will be important for you to remain in connection with the Board, and I would suggest to you to send a

copy of your Memoir to Professor Sell, who would, I doubt not, gratefully accept it.

My attention is at present directed to other matters, so that I have little information to present upon the subject. Many years ago I wrote a letter to the *Times* on arsenic in ball-dresses, which was subsequently reproduced by *Punch* with a grand illustration, entitled, "The Dance of Death." I have looked amongst my papers, but could not find a copy, else I would have forwarded it to you.

Believe me, dear Sir,

Yours very truly,

A. W. HOFMANN.

Henry Carr, Esq.

The following communication has been received from Dr. Sell, who, in compliance with the request of Dr. Hofmann, has also kindly forwarded a copy of the bill now being submitted to the German Diet. This bill, which is very voluminous, embracing "adulteration of food," and other matters, did not arrive till the second issue of "Our Domestic Poisons" was in the printer's hands; time, therefore, will not permit of any epitome being attempted at present:—

BERLIN, MARKTHALLEN.

February 25, 1879.

DEAR SIR,

I am very much obliged for your kindness in sending me your interesting book, "Our Domestic

Poisons," in which you draw the attention of the Government to the dangers really now existing in houses. Our Government is at present submitting to our Diet a law which on one side corresponds to your Food and Drugs Act, whilst it encounters as well, on the other side, the dangers which exist in the abuse of poisonous metals in general in daily life.

I take the liberty of sending to you in exchange, the official document just under consideration in our Diet, and I hope that you will find some material in it for your highly appreciable efforts.

I remain, dear Sir,

Yours faithfully,

EUGEN SELL, M.D.,

*Member of the German Imperial
Board of Health.*

The first issue of this pamphlet has already brought to light one most gratifying fact with regard to the manufacture of paper hangings—namely, that successful competition can be and is maintained, in the open market, discarding the use of arsenic entirely—"the greatest pains being taken to prevent any, even accidental, introduction of it;" and that, notwithstanding any disadvantage that may be involved in the abandonment of arsenic, a very large business is at the present time maintained in open competition with the general trade. It is stated by the best possible authority that, "There is no need to use

any colours which necessitate the use of arsenic in their production ; but whilst such colours are made with the aid of arsenic, it requires great care to prevent the introduction of it." . . . "Neither the manufacturer nor the public would lose anything in the way of satisfaction or pleasure by the total prohibition of arsenic in any form in paper-hangings. The chief point to be insisted upon is that all the colours now required for paper hangings can be produced without arsenic, and that its absence would in no way tend to increase the cost of production."

The following difficulty has been raised by the same manufacturer, but it is met by information from Dr. Taylor that other antiseptics equally good might be substituted for arsenic :—

"Arsenic being such a powerful antiseptic, there is a danger of its being introduced into glue or gelatine, usually called animal size, for there is nothing so effectual in preventing its decomposition, and being without odour, there is great temptation to use it. We use this size largely for fixing our colours, but make what we require, and so escape danger from that source."

More detailed evidence as to the above statements would be forthcoming in a Committee of the House of Commons, or under proper circumstances, but would be altogether out of place here.

From this it will be seen clearly that there is no real

difficulty in the way of total prohibition of the use of arsenic in paper-hangings; for the fact that a trade in papers non-arsenical is maintained, proves that such papers are satisfactory to the public both as regards quality, colour, and price.

The editor of the *Sanitary Record* concludes an article, which is earnest in support of the cause advocated in this pamphlet, with the following paragraph:—

“It may, perhaps be regretted that Mr. Carr has not gone into the question of lead-poisoning in connection with wall paints, floor-cloths, etc., which has, particularly of late, been attracting attention. This, however, we may perhaps hope to see embodied in a future edition, and considering how much to the purpose is the matter which has already been compressed into fifty pages, it would be ungracious in us to seek for omissions. We cordially recommend the little book to our readers.”

The suggestion now given by the editor of the *Sanitary Record* corresponds with the advice of Dr. Sieveking, in his reply to the first circular. On careful consideration it was then thought better to concentrate attention upon one or two of the more prominent poisons, such as arsenic and aniline dyes, rather than to dilute a small pamphlet with allusions to other topics which could not possibly be dealt with in a convincing manner in so small a compass. The

object has been not to write an exhaustive treatise, but to bring forward such facts and such authorities as may lead to Government investigation, the limits of which investigation would of course have to be determined hereafter.

CONCLUSION.

CONCLUSIVE proof of the ill effects of arsenical wall-papers on susceptible persons will be found in some well-marked symptoms of arsenical poisoning, and in affections commencing with the occupation of rooms with arsenical papers, always relieved by removal from, and again occurring on returning to the rooms. This is strongly marked in cases previously mentioned, and any number of other instances might be given did space permit. It is, in fact, the great number of well-marked symptoms of arsenical poisoning and the recurrence of such symptoms contemporaneously with the occupation of certain rooms that can leave no doubt on the minds of medical men as to the injurious effects of arsenical papers; as proved by the testimony of unquestionable facts.

It has already come to the writer's knowledge that the first issue of this pamphlet has drawn the attention of medical men and others to the true cause of suffering in several arsenical cases. There need, therefore, be

no hesitation in urging upon medical men to be keenly alive to the probability of chronic arsenical poisoning being the origin of illness, in a multitude of cases where there is no other obvious cause; more especially where the peculiarity is, that the symptoms do not yield, or do not yield permanently, to the ordinary remedies.

Change of air, change of scene, and relaxation, are no doubt excellent, but it is little known how often removal from some poisonous home-influence is the real foundation of the improved health attributed to "change of air." Too often is disappointment experienced on returning home, in consequence of a recurrence of the old symptoms.

Wherever there is chronic catarrh, irritation of the throat or eyes, debility, cramp, nervous twitchings, &c., or any other of the symptoms before-mentioned, by all means search for arsenical papers or other arsenical fabrics

It is confidently affirmed that the facts above stated demand Parliamentary inquiry with a view to legislation and Government inspection; the inquiry to embrace all poisonous fabrics now sold for domestic use, whether of home manufacture or imported from abroad. The laws against the sale of such poisonous materials in France and Germany would no doubt give important suggestions for legislative action in this country.

A law making the seller of such poisonous goods clearly liable to the purchaser, whether illness be produced or not, would probably be found an efficacious mode of prevention.

Further, it is desirable that purchasers should, as far as possible, require a written guarantee that articles supplied to them are free from arsenic ; they should also have them tested as a duty to themselves, their families, and to those employed in their manufacture.

Dr. Chambers gives it as his opinion that an action for special damages would, as the law now stands, lie against any manufacturer who caused arsenical poisoning, and that such would be a most efficient way of calling public attention to the question. Any one who has suffered from arsenical poisoning would confer a national benefit by bringing a case to trial and obtaining a decision in a court of law.

Lastly, as a suggestion to manufacturers, it would certainly answer the purpose of some enterprising man to advertise his wall-papers or other fabrics as *guaranteed free from arsenic and from all other materials, the employment of which is not sanctioned in a sanitary point of view by ——— Physician to ——— Hospital, and by ——— Professor of Chemistry*. The public is sufficiently alive to the question to afford every prospect of success to some energetic man who would work *bonâ fide*, and advertise freely in the new line here indicated.

Now is the time to take advantage of the demand for non-poisonous wall-papers and other fabrics, a demand for which will, without doubt, increase.

A manufacturer becoming generally known as supplying such guaranteed articles could scarcely fail to command an immense business.

It certainly does seem marvellous in this enlightened age,—in these days of Sanitary Commissioners, officers and inspectors, with millions spent on drainage and water supply, with laws relating to contagious diseases, vaccination, and the crowding of dwellings; laws grasping the largest questions and descending to the smallest minutiae,—that for the sake of getting certain shades of colour, or certain colours at a somewhat lower price, manufacturers should be allowed to saturate our houses with the most virulent of poisons, the effects of which are perfectly well known, but which are left unheeded to take their destructive course.

ANALYSIS OF WALL PAPERS.

When sending a wall paper to an analytical chemist to be tested for arsenic, the sample must be large enough to include all colours, as some may be arsenical, others not so. In the case of small-pattern papers, a piece the size of one's hand will be sufficient to allow of part being tested, and the result written on the back of the remainder. Writing on the back is most important, in order to secure the identification of the report with the sample tested. The date should in all cases be stated.

LETTERS RECEIVED IN REPLY TO PRELIMINARY INQUIRIES.

As it would of course be useless to bring a matter of this kind before the public, unless the views put forward were supported by the great authorities in Medicine and Chemistry, steps were taken in the first instance to ascertain the general opinion of the most competent men. The following letters, received in reply, will be read with interest, and will be found fully to bear out the demand for official and searching inquiry :—

From HENRY CRITCHETT BARTLETT, PH.D., F.C.S., 39, *Duke Street, Grosvenor Square.*

I am extremely interested in the investigation of the presence and effects of poisonous substances in the colouring matters used for wall-papers and dress fabrics.

During the last ten years, I have had no less than fifty-three cases of supposed injury, which were fairly attributable to such causes, and I have now two of the most unmistakable instances of such effects before me, one coming from the neighbourhood of Salisbury, and the other from Portman Square.

From Professor C. L. BLOXHAM, F.C.S., *Professor of Chemistry, King's College.*

I fully concur as to the desirability of abolishing arsenical wall-papers, together with arsenical tarlatan and confectionery ornaments, and of

saving all our arsenite of copper for the destruction of the Colorado beetle.

As I do not belong to the medical profession, I can say nothing authoritatively with respect to the action of such arsenical materials upon the human system; but my thirty years' experience as a chemist enables me to testify, if need were, to the reckless employment of arsenical green, even by some manufacturers who profess to dispense with it altogether.

From T. LAUDER BRUNTON, M.D., SC. D., F.R.C.P., F.R.S., 50, Welbeck Street, W., Assistant Physician and Lecturer on Materia Medica at St. Bartholomew's Hospital.

For some time I was inclined to believe that the evils of poisoning by arsenical paper had been exaggerated, and I therefore took no interest in your endeavours to put a stop to the practice of selling arsenical papers. I have now become convinced by personal experience that arsenical papers are capable of destroying health in the course of a few days, and I am willing to do anything in my power to aid the efforts you are making to prevent the employment of arsenical pigments in the manufacture of wall-papers. If you can tell me how I can best aid you, I shall be much pleased.

*From J. LANGDON DOWN, M.D., F.R.C.P., 39, Welbeck Street,
Physician to the London Hospital.*

I quite sympathize with you in your views respecting the large admixture of arsenical preparation in ornamental and textile fabrics.

Cases have come under my knowledge substantiating the experience of Dr. OWEN REES and others.

A movement to arouse public attention to this evil with the view of seeking its mitigation would have my approval.

A large number of references may be found in WOODMAN and TIDY's Handy-book of Forensic Medicine, page 152. Published by CHURCHILL.

*From AUGUSTE DUPRÉ, PH.D., F.C.S., Professor of Chemistry,
Westminster Hospital.*

So convinced have I been for a long time of the serious injury done by arsenical and other pigments used on a great variety of articles, and not only on wall-papers, that several years ago I strongly urged on Mr. SIMON to take the subject up, and have it thoroughly investigated by his department. I shall therefore be very glad if you now succeed in having it fully examined into, and will give you what help I can in the matter.

*From FREDERICK J. FARRE, M.D., F.R.C.P., 61, St. George's Square,
Consulting Physician to St. Bartholomew's Hospital.*

You are at liberty to add my name to your list of those who object to the use of arsenical flock wall-papers. I am satisfied of the injury which these do. I have no personal knowledge of the injurious effects of smooth arsenical papers.

*From DOUGLAS FOX, F.R.C.S., 1, Chesham Place, Brighton (late of
Derby).*

You and I talked over the subject of arsenic used in paper and other fabrics; you then said you had been moving in that matter, and had received letters from medical men speaking strongly as to the existence of arsenic in many things used by the public which produce most injurious results. I have long been aware of this gross conduct on the part of some manufacturers; various cases have from, time to time, become known to me where great injury was the result of its use.

I do hope the disgraceful use of poison in fabrics may be prohibited by a stringent Act of Parliament.

I feel much confidence as to the result of such a proceeding being thoroughly taken up if it were well introduced into the two Houses. There surely must be able men in Parliament who would willingly act, and with vigour.

From SAMUEL O. HABERSHON, M.D., F.R.C.P., 70, Brook Street, W.,
Physician to Guy's Hospital.

I have long recognized the injurious effects produced by arsenical papers, and have seen instances of serious effects being produced by them.

It is very desirable that the public should know how these arsenical wall-papers affect the general health.

From C. HEISCH, F.C.S., late Professor of Chemistry at the Middlesex Hospital; Superintending Gas Examiner to the Corporation of London; Analyst to the Districts of Lewisham and Hampstead.

I have seen so much of the evil effects resulting from the use of arsenical wall-papers and pigments, especially those employed in colouring the artificial flowers worn by ladies (on which the pigment frequently lies almost as a loose powder), that I shall be most happy to join in any movement which will conduce to their disuse, or better still, their prohibition, if such be possible. It ought to be more generally known than it is that arsenic is by no means confined to green colours. Many of the French greys and other neutral tints contain even more arsenic than the greens. Nothing but an examination of the individual sample of paper, or colour, will secure any one against its presence.

From JOHN F. HODGES, M.D., F.C.S., &c., Professor of Chemistry,
 Queen's College, Belfast.

I am very glad to find that an effort is to be made to direct the attention of Government to the dangerous effects produced by lining our houses with papers containing deadly poisons. I have laboured for a great many years to combat this evil practice, and in this locality my warnings have not been without service.

I have repeatedly called the attention of the public to the use of poisonous pigments as a frequent cause of disease, and some time ago the Grand Jury of the County of Antrim, in consequence of my reports as County Analyst, passed a resolution that the members for the County be requested to bring the sale of poisonous room-papers under the notice of Government.

From JABEZ HOGG, Esq., 1, Bedford Square, Consulting Surgeon to the
Royal Westminster Ophthalmic Hospital.

I entirely concur in the view expressed in your letter as to the great danger to the public health from wall-papers and window curtains, made with arsenical colours. I have in the course of my practice seen a number of serious cases of illness from arsenical *domestic* poisoning; the peculiar irritating effect of the arsenical dust of a room first showing itself in the eyes of my patients, the outer coat of the eye, and the mucous membrane of the nose becoming simultaneously affected. An obstinate *conjunctivitis* goes on for a long period in those who are not entirely confined to the house, and which defies ordinary methods of treatment. The patient improves by change of air, but on returning home the disease once more sets in, and an obstinate ophthalmia renders it impossible to remain at work for more than an hour or two during the day. The sanitary condition of the house is suspected, at length the paper on the walls of the room, and this, on being tested, reveals the cause of the mischief to be *arsenical poisoning*.

Quite recently a gentleman from the War Office consulted me for an obstinate affection of his eyes; I suspected arsenical poisoning, and requested him to submit the wall-paper to Professor ABEL; this gentleman wrote to my patient "your wall-paper contains a good deal of arsenic, which is easily rubbed off." On the removal of the wall-papers the persistent ophthalmia got rapidly well.

From my personal knowledge I can state that arsenical wall-papers are a grave source of mischief.

From GEORGE JOHNSON, M.D., F.R.S., 11, Savile Row, Physician to
King's College Hospital.

I think it very desirable that something should be done to prevent the use of arsenic in the manufacture of wall-papers.

From WILLIAM ORD, M.D., F.R.C.P., 7, Brook Street, Physician to
St. Thomas's Hospital.

I have no doubt whatever of the frequent occurrence of arsenical poisoning by the agency of wall-papers, dress fabrics, and the like; and

am decidedly of opinion that the matter is deserving of full inquiry with a view to preventive legislation.

I shall be glad if you will make the use proposed of my letter ; chiefly because another widely diffused source of danger from arsenical compounds has recently come under my notice. A child having been brought into St. Thomas's Hospital with symptoms of poisoning by belladonna, some fly-papers which were brought from the room in which the child was taken ill were submitted to chemical examination. They proved to contain a large quantity of arsenic, each paper yielding several grains of a soluble salt of that metal—the arsenite of potash. Hitherto I had supposed fly-papers to contain quassia and to be harmless ; here then is again a proper subject for inquiry.

From GEORGE OWEN REES, M.D., F.R.S., 26, *Albemarle Street,*
Consulting Physician to Guy's Hospital.

I was glad to receive your letter, and your suggestion appears deserving of attention. My belief is, however, that the quickest way to do good would be to get some influential M.P. to take the matter up, and get a Government Commission formed. I felt it my duty to publish the facts I had discovered in the *Times*, that the public might be sure to see them stated, and to sign my name to give authenticity to the letter, though I am generally unwilling to treat of matters medical in the public papers.

I wonder much that some member of Parliament does not take the matter up as it now stands. It is quite as important as half the subjects engaging the attention of the House.

From H. E. ROSCOE, F.R.S., *Professor of Chemistry, Owen's College,*
Manchester.

I have much pleasure in stating that I shall be glad to allow my name to appear on your list as strongly objecting to the use of arsenical colours for paint, papers, or fabrics.

From EDWARD H. SIEVEKING, M.D., F.S.A., 17, *Manchester Square*
Physician to St Mary's Hospital.

Other engagements have prevented my replying earlier to your letter of the 30th June, relative to the propriety of addressing a memorial to Government, on the subject of chronic arsenical poisoning. I quite endorse your view as to the importance of the subject. I am afraid that various poisons, vegetable, arsenical, cupreous, saturnine, and antimonial, are employed in trades, producing substances used in food or clothing, and if a great effort has to be made, it appears to me better to include all deleterious agents, than to bestow attention only upon one.

I am afraid that any political agitation is altogether beyond my province, but should my *confrères* be willing to support you, I shall be glad to hear how you progress.

From JOHN SIMON, C.B., F.R.S., *late Medical Officer of the*
Privy Council.

I believe it to be quite certain, and among well-informed persons notorious, that the use of arsenical colours in house decoration and in articles of dress is a real danger to health, and has in many instances been of serious injury; and I suppose it to be equally certain that the evil will continue, and probably increase, unless those uses of arsenic are prohibited by Act of Parliament; but my personal knowledge of cases of injury has not been of such a sort that I can add anything of weight to the opinions which you already have on the subject.

NOTE—This was written by Mr. SIMON on the other letters being submitted to him.

From PIERCE ADOLPHUS SIMPSON, M.D., *Professor of Forensic*
Medicine, University of Glasgow.

I have much pleasure in expressing my sympathy with the movement which you have in hand for preventing the use of arsenic in the manufacture of wall-papers and other fabrics. I frequently meet with cases of poisoning from this source, and I should be glad to see restrictions placed on the manufacture, sale, and use of arsenical colour, similar to those enforced, with so much advantage, in some other countries.

From JOHN STENHOUSE, LL.D., F.R.S., 17, Rodney Street, late Assayer to the Royal Mint.

In reply to your letter of the 30th, I think it very desirable that there should be some legislation on the subject of arsenical poisoning occasioned by the use of paper hangings, &c., prepared with arsenical pigments, and have no objection to allow you to make use of my name as approving of the objects stated in your letter.

I think the plan you propose is an excellent one, and will elicit the opinion of a large portion of the medical faculty, although it should be remembered that by far the greater number of medical men have never directed their attention to this source of danger.

I do not at present occupy any office in connection with any of the hospitals; but formerly I was for nearly seven years Lecturer on Chemistry at St. Bartholomew's.

From ALFRED S. TAYLOR, M.D., F.R.S., &c., 15, St. James's Terrace, Regent's Park, late Professor of Chemistry and Medical Jurisprudence in Guy's Hospital.

I can assure you that it will give me great pleasure to lend any support that may be in my power to the object which you have in view.

The use of arsenic in the manufacture of wall-papers or articles of clothing and furniture should be suppressed. I quite agree with Dr. REES that many cases of unexplained illness are to be accounted for by the noxious practice of surrounding ourselves with arsenic in wall-papers and in furniture.

I do not doubt that your views will receive general support from the medical profession. Dr. GUY, of Gordon Street, and Dr. JOHNSON, of Savile Row, have both published many facts in reference to the use of arsenic in these manufactures and the dangers arising therefrom.

In a Committee of the House of Lords, I was asked, I think it was by the late Lord Salisbury, whether I would stop the manufacture of arsenical green papers altogether? I said, "Yes, excepting under one condition, namely, that they should be printed with a pattern of a skull and cross bones, and motto underneath of *Memento mori*."

*From C. MEYMOTT TIDY, M.B., F.C.S., 48, Queen Anne Street,
Professor of Chemistry, London Hospital; Medical Officer of
Health, Islington.*

In answer to your letter, I have to say—

1.—That in my experience, an enormous number of papers (and not merely green papers) contain arsenic.

2.—That I know of a large number of cases of poisoning caused by the use of such papers.

3.—That I consider their sale ought to be prohibited by law.

I am myself horrified at the freedom with which arsenic is being used in certain manufactures.

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